DOCUMENT RESUME

ED 035 186 EF 001 852

TITLE	Building Security. Honeywell Planning Guide.
INSTITUTION	Honeywell, Minneapolis, Minn.
REPORT NO	Pep-54-0349
PUB DATE	Jan 69
NOTE	34p.
EDRS PRICE	EDRS Price MF-$0.25 HC-$1.80
DESCRIPTORS	Automation, *Building Design, Building Operation, *Crime, Delinquency, Electronic Control, *Electronic Equipment, Operating Expenses, Police, *Prevention, Safety, *Security

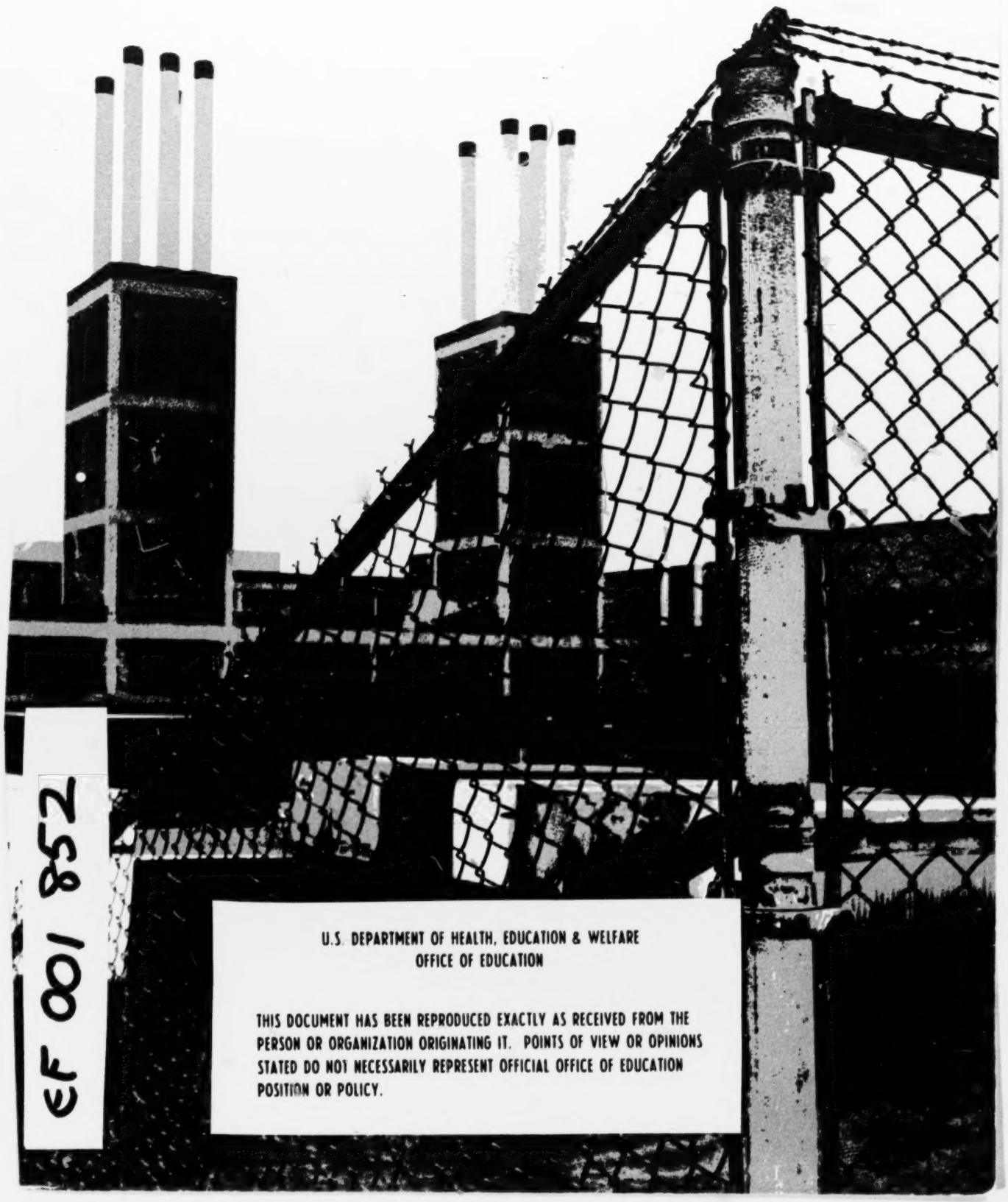
ABSTRACT

A general discussion of building detection and alarm systems to provide security against burglary and vandalism is provided by a manufacturer of automated monitoring and control systems. Security systems are identified as--(1) local alarm system, (2) central station alarm system, (3) proprietary alarm system, and (4) direct connect alarm system.. Detection devices are briefly described for perimeter, area, and object protection. A discussion of economic factors includes a comparison of different security systems. Additional topics cover line protection, access control, watchman tour systems, equipment surveillance, and centralized control systems. (MM)

ED035186

HONEYWELL PLANNING GUIDE

BUILDING SECURITY



EF 001 852

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

ED035186

THE INCREASING NEED FOR PROTECTION

Protection of property and personnel is a function in the operation of buildings which is becoming increasingly important as the size, scope and investment of these structures continues to grow. In one form or another, building security systems are a requirement in almost every type of facility.

In recent years, the approach to protection systems has changed as new and ever-increasing demands have been made and as new technologies have been developed to satisfy these demands.

This booklet has been prepared to acquaint you with modern building security systems and to help you plan for your protection requirements.

WHAT DOES BUILDING SECURITY MEAN?

According to the dictionary, security means "the quality or condition of being secure."

To the modern businessman, building security might mean guards and equipment to protect his facilities. But in fact, security means a variety of things to the people he works with daily.

First of all, to his guard force, it means providing enough men and equipment to protect the building, the equipment in it and the personnel who work there. To his management, company directors and stockholders, it means providing adequate protection at the most efficient expenditure of funds in order to preserve profits. To his customers, security means keeping a critical overhead item at minimum cost in order to keep price of his products or services at a reasonable level. And to his employees, it's a key factor affecting their feeling of safety.

Unfortunately, it is possible to have a false sense of security and "get by" on a minimum of protection—especially if a run of good fortune should lead the building owner to believe that vandalism, burglary, fire, mechanical breakdowns or some other misfortune "can't happen to me."

It is not realistic for a manufacturer to fully insure a shipment of products to a customer but leave his building unprotected. Obviously, adequate security measures are just good business. A businessman cannot afford to be complacent about security.

A BRIEF BIT OF BACKGROUND

The origin of alarm systems actually dates back to ancient times. Through many centuries, a variety of mechanical gadgets have been contrived to detect intruders.

The era of modern security, however, dates back to just 100 years —to the advent of the electrically-operated alarm. The first of these were simple "burglar alarms," used to help protect banks and retail stores. These gradually improved in effectiveness until the World War I period, when national defense requirements led to the rapid development of much better systems.

It wasn't until World War II, however, that the security industry really saw the major share of its growth. The threat of highly-skilled enemy agents made it necessary to invent more sophisticated and fool-proof systems. Through the tense "Cold War" period, also, these systems were continually refined and perfected.

The current state of the art is such that today you can avail yourself of the modern types of systems that are described for you in the following pages of this booklet.

CLASSIFICATIONS OF SECURITY SYSTEMS

A word here about the major classifications of security installations that are commonly in use today. They include:

1. *Local alarm system*—A system in which the alarm sounding device is located in the immediate vicinity of the protected area. Applications: shops, filling stations, other small retail establishments.

2. *Central Station alarm system*—A system in which the alarm signal is relayed to a remote panel located at some centralized facility

owned by an outside agency—usually a privately-owned protection agency. Applications: Same as Local alarm systems.

3. *Proprietary alarm system*—A system in which the alarm signal is relayed to a headquarters location owned, manned and operated by the proprietor, or his agents. Applications: school systems, industrial facilities, municipalities, office buildings, military bases, large institutional buildings and others.

4. *Direct Connect alarm system*—A system where the alarm signal is carried to an alarm annunciator at a remote location such as a police station. (This system is often combined with Proprietary alarm systems to provide additional protection.) Applications: Same as Proprietary alarm systems.

Until recent times, Local and Central Station systems were the most common types. But today's requirements have now made Proprietary and Direct Connect systems the most popular.

Local Systems

Local systems will continue to be used wherever it is impossible to transmit an alarm signal. However, the value of sounding an alarm right at the protected premises leaves much to be desired from four special standpoints:

1. The detection equipment is usually ultra-simple and is therefore easily defeated.

2. False alarms annoy neighbors.

3. Intruders may not be too disturbed by bells and other audible alarms if they know they have time in which to operate, or if the alarm is sounded only when the intruder is leaving the premises.

4. On-the-spot alarms rarely catch the intruder (for example, how many times have *you* responded to someone else's burglar alarm?)

Central Station Systems

Central Station systems enjoy popular favor in densely populated urban centers. In most "downtown" metropolitan areas, there are hundreds of small establishments which prefer a higher degree of protection than is possible with a Local System but which cannot afford their own guard force. To accommodate these businesses, a central station company is formed.

Leased telephone lines connect each individual business (subscriber) with the central station. Of course, the physical location of the central station must be close to the clients it serves in order to justify the service economically.

When an alarm is received at the central station, a dispatcher telephones the police department and requests that a patrol car be sent to the subscriber's place of business. In addition, many central station companies maintain a guard force of their own which is dispatched along with the municipal police in response to alarms. The central station guards are frequently furnished with keys to the protected premises to permit immediate access in the owner's absence.

Proprietary and Direct Connect Systems

Proprietary and Direct Connect systems represent the newest and fastest growing classification of security systems. They were developed to satisfy the complex needs and the demands for extreme flexibility which typify so much of today's business activity.

Perhaps the most obvious example of a Proprietary system is one installed in an industrial plant which maintains its own guard force. Actually, the plant may consist of many separate buildings, each with its own individual security requirements. There may be areas devoted to classified government work; to storage of finished products; to office space; to manufacturing, and so on.

Whatever the requirements in each area may be, protection equipment can be devised to meet them. This equipment is then wired back to a control panel at a headquarters manned by the plant protection force. If adequately designed, the control panel will allow one man at headquarters to effectively protect the entire plant.

Frequently, the Proprietary control system is backed up with a connection to an alarm at police headquarters, forming a Direct Connect system. This offers additional protection. For example, if the man at the Proprietary panel failed to take prescribed actions for any reason, an alarm would automatically be transmitted directly to the local police who would immediately investigage.

Many other organizations are using Proprietary and Direct Connect systems in a wide variety of situations. For example:

School districts employ such systems to protect buildings from the ravages of vandalism. Schools located throughout a community may

be ideally linked to one central point. In many cases, that point can be the local police department.

Office buildings have found it quite profitable to combine all protection facilities at one central point within the building.

Department stores, particularly those with several units, have minimized guard forces and increased protection with combination Proprietary and Direct Connect systems.

Of course, military bases have swung to such systems as the best answer to the problems created by large physical facilities and widely divergent protection requirements.

THE ECONOMICS OF BUILDING SECURITY

The installation of a proprietary building security system presents a built-in opportunity to contribute to the profit picture and well being of your company. Perhaps no other capital investment can deliver all these advantages:

1. Modernize all security systems for the most comprehensive protection
2. Amortize the equipment in about three years
3. Pay a handsome profit each year thereafter

That is what you can accomplish with a proprietary building security system. Experience with hundreds of the nation's large and small industries, businesses and institutions has proven that Honeywell can save you security dollars and expand your building's protection at the same time. By investigating the possibilities that a Honeywell Proprietary Building Security System offers you and your building, you will see that such a system is a common sense, profit-making proposition.

Is a Security System profitable?

Only a survey of the factors peculiar to your own installation will tell you how profitable you can expect a security system to be. That's why you'll want to study and carefully evaluate all of the automatic electronic systems that are now available to help you protect your facilities. The right combination of men and modern security equipment can often save you a large percentage of what you are currently allocating to security expense—and actually provide better security for your facilities!

There are a number of advantages common to modern security systems that you should first consider before evaluating each one of them for possible application.

Here are the most important ones:

1. They eliminate protection service fees.

2. They utilize central panels to help your guards co-ordinate your protection network.

3. Immediate electronic alarm signals save both footsteps and valuable reaction time.

4. They provide continuous protection of areas, not hit-or-miss "spot check" security.

5. They free manpower for other critical protection duties.

6. They give you extra peace-of-mind by providing the most complete protection possible.

7. They can save you money—in fact, more than $25,000 annually per 24-hour-a-day guard post wherever such posts can be eliminated, according to a government survey.

EXAMPLES* OF HONEYWELL PROPRIETARY BUILDING SECURITY INSTALLATIONS

INSTALLATION	TYPE OF SYSTEM	COST OF SYSTEM	RECOVERY PERIOD
Appliance Manufacturer	Intrusion detection, fire, equipment monitoring	$28,000	5 months
Appliance Manufacturer	Gate control, intrusion detection, fire, equipment monitoring	$23,000	10 months
Electronics Manufacturer	Security, fire, equipment monitoring	$64,000	20 months
Office Building	Door and gate control, intrusion detection, fire, equipment monitoring	$49,000	15 months
Police Department	Automated communications system	$30,000	18 months
School District	Intrusion detection, fire, equipment monitoring	$31,000	11 months
Small-town Business	Intrusion detection, fire	$ 7,200	48 months

*Names available upon request

ECONOMIC ANALYSIS

The following five charts give a typical economic analysis to illustrate the savings possible from the installation of a Honeywell Proprietary Building Security System versus a less comprehensive system supplied by a central station service.

Chart I gives details on the number of alarm points that are actually in an existing system (114) versus how many alarm points *should* be included (322).

Chart II shows that a proprietary system can save its owner at least $32,344 a year in manpower alone while increasing protection by 208 alarm points.

Considering the various costs and savings, Chart III shows that a new Honeywell Proprietary Building Security System can replace an installed central station service and pay for itself in 17 months.

Chart IV compares a new installation of a central station service to a new installation of a Honeywell Proprietary Building Security System. During the first year, there is a $55,052 savings with the proprietary system, and every year thereafter there is a savings of $75,052 with the proprietary system.

Chart V compares the cost of a Honeywell Proprietary Building Security System to the cost of operating an existing central service system.

In every comparison, the proprietary system proves to be the most economical system to operate and the only approach to building security that will pay for itself in a short period of time.

CHART I

ANALYSIS OF PROTECTION SYSTEM
CENTRAL STATION SERVICE VERSUS HONEYWELL PROPRIETARY SYSTEM

Building	Manual Fire Alarm Station		Guard Reporting Station		Door Security Locations		Sprinkler Supervision Points	
	Central Station	Honeywell Proprietary	Central Station	Honeywell Proprietary	Central Station	Honeywell Proprietary	Central Station	Honeywell Proprietary
#1	3	12	—	30	27	30	20	20
#2	4	32	—	30	—	24	12	12
#3	3	18	—	12	24	27	3	3
#4	1	10	—	12	9	9	4	4
#5	0	2	—	2	—	2	—	—
Util. Bldg.	0	2	—	2	—	10	2	2
Gate	0	1	—	—	—	—	—	—
Cafeteria	0	3	—	2	—	7	2	2
TOTALS	**11**	**80**	**—**	**90**	**60**	**109**	**43**	**43**

Total Number of Alarm points with Honeywell Proprietary System: 322
Total Number of Installed Alarm Points with Central Station Service: 114
Net Gain in Total Number of Alarm Points: 208

CHART II

PERSONNEL CONTROL SAVINGS ANALYSIS

Building	Guard Hours Per Week With Central Station Service	Guard Hours Per Week With Proprietary System	Guard Hours Saved Per Week With Proprietary System	Dollars Saved Per Week@$2.00/hr. with Proprietary System	Saved Per Year With Proprietary System Hours	Saved Per Year With Proprietary System Dollars
1	307	163	144	$288	7,488	$14,976
2	295	79	216	$432	11,232	$22,464
3	168	45	123	$246	6,396	$12,792
4	135	55	80	$160	4,160	$ 8,320
TOTAL SAVINGS:	**905**	**342**	**563**	**$1,126**	**29,276**	**$58,552**
Less hours required to man the Honeywell Proprietary System			252	$504	13,104	$26,208
NET PERSONNEL SAVINGS WITH A HONEYWELL PROPRIETARY SECURITY SYSTEM			311 hours	$622	16,172	$32,344

CHART III

FINAL COST ANALYSIS
INSTALLED CENTRAL STATION SERVICE VERSUS A NEW HONEYWELL PROPRIETARY SYSTEM

Savings Per Year

Personnel Savings (Chart II) $32,344
Fixed Annual Service Charge of Central Station Service (114 points) 20,000
TOTAL Savings Per Year by Using a Honeywell Proprietary Security System instead of Central Station Service $52,344

Proprietary Security and Fire Detection System (322 points) .. $70,000
Maintenance Contract for above Systems 3,500
TOTAL Proprietary System Costs .. $73,500

$ 4,362 Savings per month

RECOVERY PERIOD: 12 mo. / $52,344 — 17 Months / $4,362 / $73,500

COMPLETE PAY-OFF OF THE HONEYWELL PROPRIETARY BUILDING SECURITY SYSTEM IN 17 MONTHS WITH AN INCREASE OF 208 ALARM POINTS!

CHART IV
COMPARISON OF NEW INSTALLATIONS

CENTRAL STATION SERVICE		HONEYWELL PROPRIETARY SYSTEM	
First Year		**First Year**	
Advanced Service Charge for 114 alarm points (Chart I)	$ 50,000	Purchase of Honeywell Proprietary System for 332 alarm points (Chart I)	$ 70,000
Fixed Annual Service Charge	20,000	Maintenance Contract for 1 year	3,500
Guard Force Manpower Costs (Chart II: 905 hrs x 52 x $2.00/hr)	94,120	Guard Force Manpower Costs (Chart II: 342 hrs x 52 x $2.00/hr)	35,568
TOTAL	**$164,120**	**TOTAL**	**$109,068**
Second Year and Thereafter		**Second Year and Thereafter**	
Fixed Annual Service Charge	$ 20,000	Maintenance Contract for 1 year	$ 3,500
Guard Force Manpower Costs	94,120	Guard Force Manpower Costs	35,568
TOTAL	**$114,120**	**TOTAL**	**$ 39,068**

For new installations, Honeywell Proprietary Building Security Systems usually pay for themselves in less than a year compared to leased systems. The above comparison shows there is a $55,052 savings the first year and $75,052 each year thereafter with the proprietary system—in addition to more thorough protection by an increase of 208 alarm points!

CHART V
COST ANALYSIS OF CHANGEOVER FROM CENTRAL SERVICE SYSTEM TO PROPRIETARY SYSTEM WITH IDENTICAL SERVICE AND MANPOWER

EXISTING CENTRAL SERVICE SYSTEM * (114 pts) (No credit given for Advanced Service Charge when service is terminated)		HONEYWELL PROPRIETARY SYSTEM ** (114 pts) (Purchase and installation: $65,000)	
Per Year		**Per Year**	
Fixed Annual Service Charge	$20,000	Fixed Annual Service Charge	—
Maintenance Charge (included in above)	—	Maintenance Contract	$ 3,250
TOTAL	**$20,000**	**TOTAL**	**$ 3,250**

*Advanced Service Charge for this system would be $50,000. The initial fee cannot be considered, however, because this example assumes that the leased system is already in operation and the fee has been paid years ago. Even when the equipment from a central station service is removed, there is no refund or rebate on this $50,000 charge.

**With a Honeywell Proprietary Building Security System, the initial cost reflects the outright purchase and the installation of the equipment. Thereafter, the owner of the equipment is free to do with it as he wishes. If he chooses to maintain the system himself, he may do so without incurring a maintenance contract charge. However, Honeywell Maintenance is always recommended.

$20,000 Annual Service Charge for leased system
— 3,250 Maintenance Contract for proprietary system
$16,750 Savings Per Year

$ 1,396 Savings Per Month
12 mo. / $16,750

47 Months recovery period of Honeywell Proprietary System
$1,396 / $65,000 Proprietary System cost

In this typical example, the recovery period for the initial cost of the Honeywell Proprietary Building Security System will be 47 months. Thereafter, the proprietary system will save $16,750 per year compared to a leased system if identical service and manpower are maintained. In most cases, however, reduced manpower requirements with a proprietary system will increase yearly savings significantly.

A CLOSER LOOK AT SECURITY

Let's begin our discussion of individual security systems by noting that such systems are usually classified into three categories relating to *location* of the protection provided within any facility. These three categories are:

1. Perimeter (point-of-entry) protection
2. Area (space) protection
3. Object (spot) protection

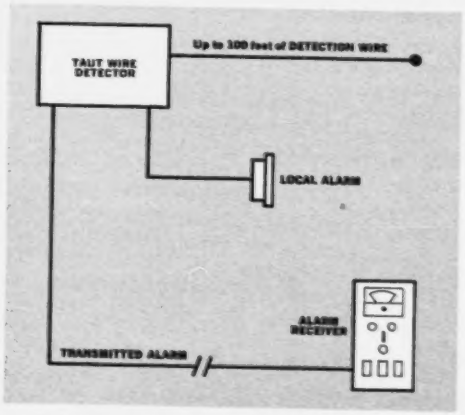
This simply means that you can provide protection at any or all of three successive levels—at an intruder's point of entry, through the general area he attempts to travel or at the actual spot or object he wishes to reach. In critical applications, many owners wish to set up a series of baffling obstacles for the intruder—two or perhaps all three of these progressive, low-cost forms of protection as extra security insurance. This is known as providing protection "in depth."

A variety of special signaling systems, such as door and gate control systems and closed circuit television can be added so that an entire building or complex of buildings can be monitored and operated by one man.

OUTDOOR PERIMETER PROTECTION

Perimeter protection is your defense outpost. Good protection at the perimeter of your facilities will sound the alarm at the first breach of security. There are two kinds of perimeter protection—outdoor and indoor.

A particularly effective and practical method of providing reliable outdoor perimeter protection is with a *taut wire detection system.*



This system can be used to guard 100 feet of perimeter per control panel. Additional panels and detection wire can, of course, be installed as needed.

In the taut wire detection system, an almost invisible but very strong wire is strung along the top of a fence or wall. It is held at

a scientifically-calibrated tension by a unique mechanism. Either a relaxation of the tension (due to wire-cutting, for example) or addition to the tension (pressure from an intruder's hand, say) will set off an immediate alarm. The tension is such that the wire need not actually be touched to set off an alarm—movement of the fence caused by even a careful climber will activate it.

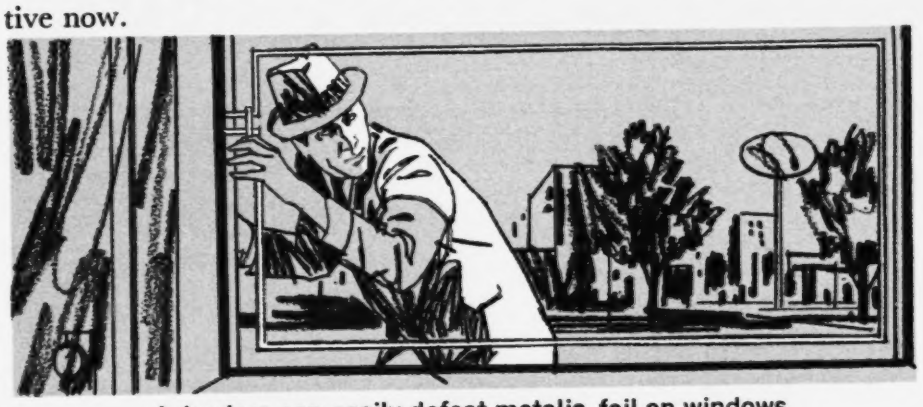
A Honeywell exclusive "Weather Bar" assures trouble-free operation in all types of weather by automatically adjusting for changes in temperature and by compensating automatically for rain, sleet, hail and snow.

This dependable and simply-constructed system allows you to protect vast stretches of perimeter at exceptionally low cost. It's a system that has proved its effectiveness through many working installations at leading firms, institutions and military installations.

INDOOR PERIMETER PROTECTION

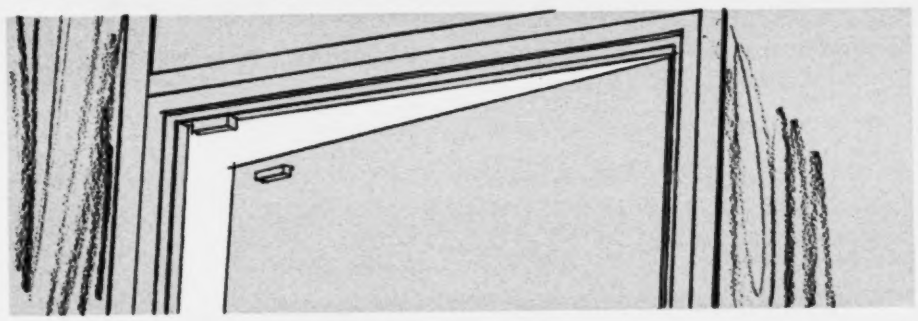
Indoor perimeter protection is somewhat easier to accomplish since climatic problems are eliminated, or at least minimized. But many other problems remain. One major factor is the expense involved in thoroughly protecting the total perimeter walls of a building (which, of course, would still have floors and ceilings unprotected). Another major problem is the configuration of the building and the partition walls within it.

The impracticality of total indoor perimeter protection, in most cases, has led to two alternatives: (1) area protection and (2) protection at points of normal access (primarily doors and windows). Area protection is discussed later. Let's consider the other alternative now.



Intruders can easily defeat metalic foil on windows by cutting glass as illustrated. See next page.

Metallic foil, a detection device for windows and glass doors, consists of strips of foil taped to a glass surface in the expectation that the foil will break if the glass breaks. In effect the foil is like a fuse; breaking the foil breaks an electrical circuit. When the circuit breaks, an alarm is actuated. Unfortunately, the foil or "window tape" is somewhat prone to false alarms and resultant high maintenance cost. More important, it is easily defeated by clever intruders.



Contact devices are electric switches mounted on a door or window so that opening the door or window actuates an electrical circuit and consequently signals an alarm.

Most devices of this type can be defeated by experts but they are not as obvious as metallic foil and are relatively maintenance-free.

Experts in the security industry recommend contact devices for auxiliary protection in conjunction with electronic area protection.

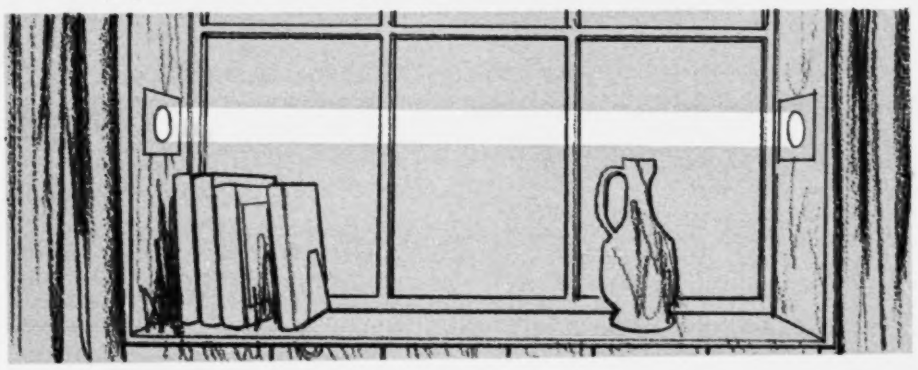


Photo-electric systems are basically the same systems used to open supermarket doors automatically for customers. When a light is beamed at a receiving cell, an electrical current flows. When the beam is interrupted, an alarm is set off.

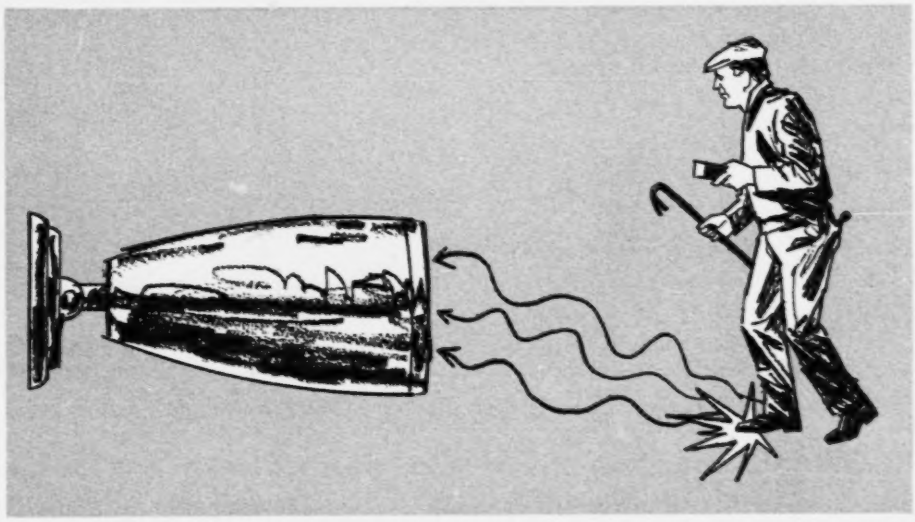
Invisible light—infrared or ultraviolet—can be used to make the system difficult for an intruder to spot. Additional protection is

offered by making the light a flickering beam—one that is interrupted in fixed sequence. Since the light source and receiver are tuned to the same frequency, an intruder cannot substitute another light source. Mirrors can be used to reflect the beam over a wide area or to completely surround an object.

AREA PROTECTION

Detecting Instrusion Sounds

One of the most effective methods that has been developed to detect the presence of unwarranted personnel in an area is through the use of *automatic audio detection systems.*



These systems use microphone-speaker units (or "audio detectors") that are installed in an unoccupied area to listen for suspicious sounds. Any strange noises, such as those made by a vandal or burglar, are immediately picked up and reported to an alarm panel at guard headquarters (or any other desired location).

The sensivity of these systems can be adjusted to pick up the exact level of sound needed for each application—a tap on a window, a muffled cough, footsteps, whispering, etc. Any sound above the prescribed level instantly sets off an alarm at the remote monitor panel. In the Honeywell system, the guard on duty can then listen to the actual sounds to determine how many intruders there are and what they are doing.

If the situation warrants it, he can dispatch a guard patrol to the

scene—and this is where the two-way communication feature of the Honeywell system becomes particularly valuable.

While the patrol is on its way, the headquarters guard can continue to listen in. When the patrol arrives, he can give instructions and continue to monitor the situation, thus assuring complete control at minimum jeopardy to the responding patrol.

In some instances, the two-way communication feature is used by the headquarters guard to issue scare commands to frighten or confuse the intruder.

Detecting Intrusion Vibrations

The walls, floors and ceilings of an area can be protected at low cost and with exceptional reliability through the use of *electronic vibration detection systems.*

Highly sophisticated "contact" microphones are affixed to the surfaces to be protected and connected to an electronic control panel. Any attempt to penetrate the surface is instantly detected and an alarm signal is transmitted to guard headquarters or other locations.

Sensitivity is adjustable to meet specific requirements. For example, protecting glass surfaces requires much finer sensitivity adjustment than concrete walls.

The system also provides for alarm discrimination. This is a form of electronic filtering which prevents alarms being transmitted due to normal vibration conditions which may occur: someone inadvertently tapping on a protected vault, raindrops on a protected

window, normal building vibrations and similar occurrences.

Audio monitoring and intercommunication capabilities may be added to any electronic vibration detection system, using the same wiring network, so as to permit a guard to listen in to the area when an alarm occurs and to communicate with the investigating guard.

Detecting Intrusion Movements

The most sophisticated intrusion detection systems detect actual *movements* of an intruder in a protected area. Properly applied, these systems offer an extremely high degree of protection. However, application engineering can be critically important. Improper or poorly designed installations will either yield so many false alarms that confidence in the equipment is destroyed or be so insensitive as to be worthless against a clever intruder. The most reliable motion detection systems utilize these principles:

1. Capacitance change
2. Sonic wave patterns

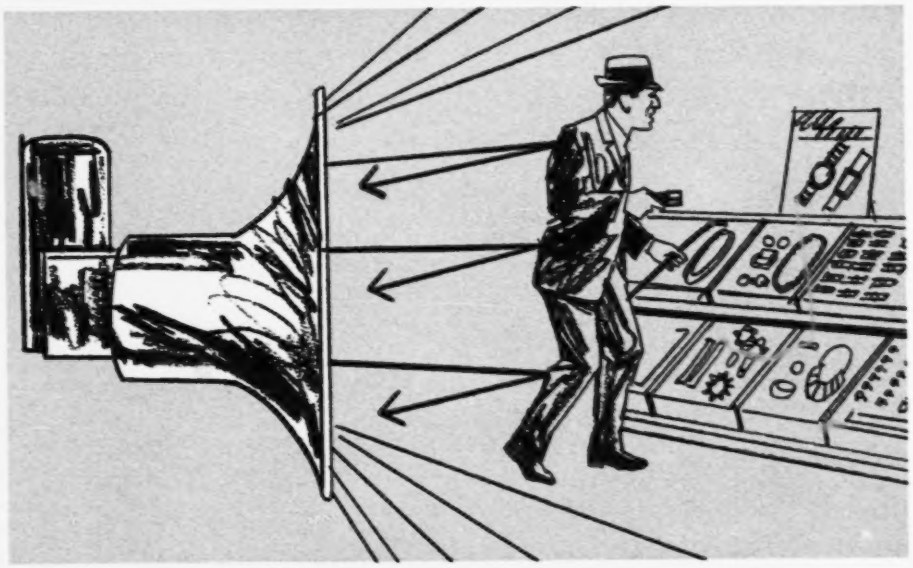
Capacitance Change Motion Detection

Any metallic substance can be made an antenna for Honeywell's capacitance change motion detector. The antenna may take any form. In fact, ordinary objects such as desks, tables, picture frames, filing cabinets, etc. may be transformed into antennae for the system.

Any person coming within several feet of the antenna will cause a capacitance change in the system which is detected at a control panel and converted to an alarm signal.

Because the antenna can be almost any object or group of objects as well as being an independent antenna in virtually any configuration, the detection system is totally unobtrusive even to expert intruders. Yet, capacitance change motion detection is unusually stable in operation, providing a high degree of alarm reliability.

As with most Honeywell detection systems, audio monitoring and intercommunication capabilities can be superimposed on the capacitance change motion detector.



Sonic Wave Pattern Motion Detection

The sonic wave pattern system uses a transceiver which transmits and receives back a characteristic pattern of sound waves. When the protected area is normal (no movements), the pattern transmitted and the one received are in balance. Man-made movement in the area distorts the sonic wave pattern. This distortion is detected at the control panel and translated into an alarm signal which is instantaneously sent to guard headquarters.

In small areas, the transceivers are usually grouped to provide protection for the entire space. In large areas, the devices are scientifically located to provide protection zones or traps.

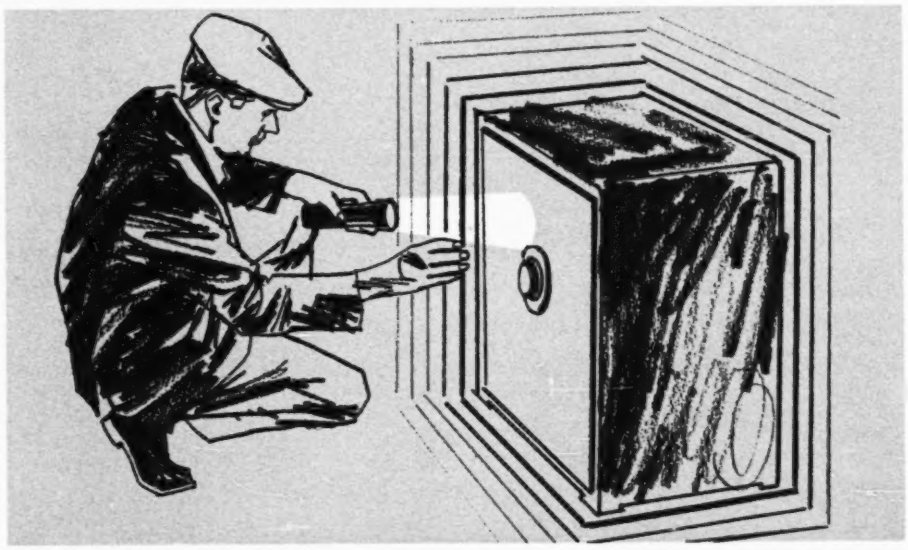
The total system is designed to be highly responsive to the frequency

disturbances caused by man-made movements but insensitive to motion created by air distribution systems and other normal movements in a protected space. Built-in alarm discrimination circuits further insure the reliability of alarm signals.

OBJECT PROTECTION

The final goal of an intruder is frequently an object such as a safe, cabinet, desk or specific thing. Accordingly, it makes sense to directly protect the object itself wherever possible. Sonic wave pattern motion detectors, contact devices and many other systems can be employed in particular situations. But, the most frequently applied systems are:

1. Capacitance detection
2. Electronic vibration detection

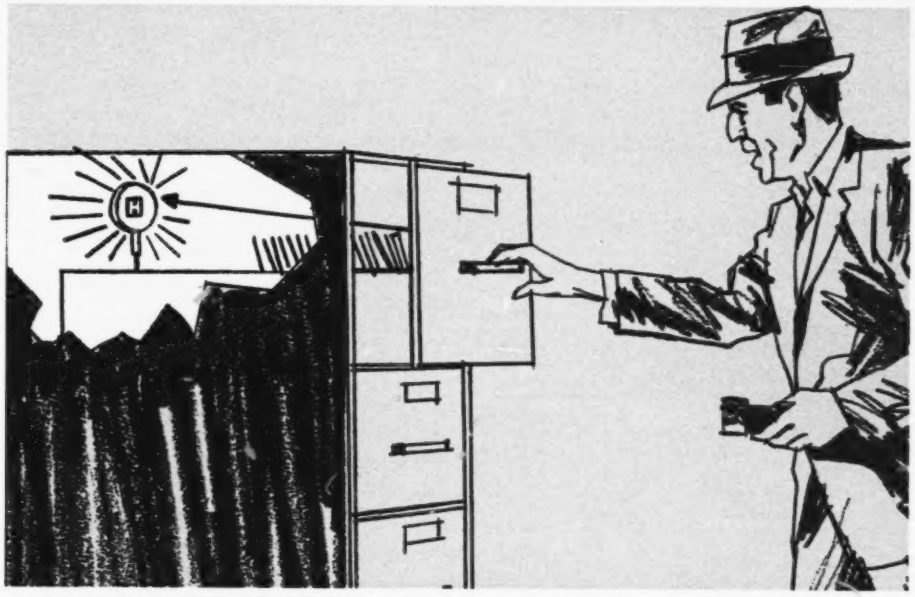


Capacitance Detection

Safes are the objects most frequently subject to attack and capacitance detection is the system most widely used to thwart such attacks. In this application, the entire safe is made an antenna for the capacitance detector. Anyone approaching the safe is immediately detected and causes an alarm to be actuated. Detection and alarm occur before the safe is actually attacked.

The system is identical in principle of operation to the capacitance change system used for area protection. The difference lies in the detection range and sensitivity.

Of course, other objects may be protected using the same principle. Typically protected objects include paintings, displays of valuable items, storage repositories and models.



Electronic Vibration Detection

Electronic vibration detection was discussed previously under area protection. It is also widely applied in safeguarding objects.

Inconspicuous contact microphones specifically designed for this type of application are affixed to the object to be protected and wired to a control panel. Anyone touching, hitting, moving or otherwise upsetting the object is instantly detected.

Low cost and simplicity of application make this system popular for protecting cabinets, files, desks, display cases and a host of other objects. Sensitivity is easily adjusted to meet the requirements of the installation.

LINE SUPERVISION

All security systems in general use today use wires to connect the various detecting devices with the alarm receiving equipment. Frequently, these wires are leased telephone lines, but they may be wires of almost any kind.

A short circuit, a broken wire, or other serious malfunction would render the security system inoperative. Therefore, all well-designed

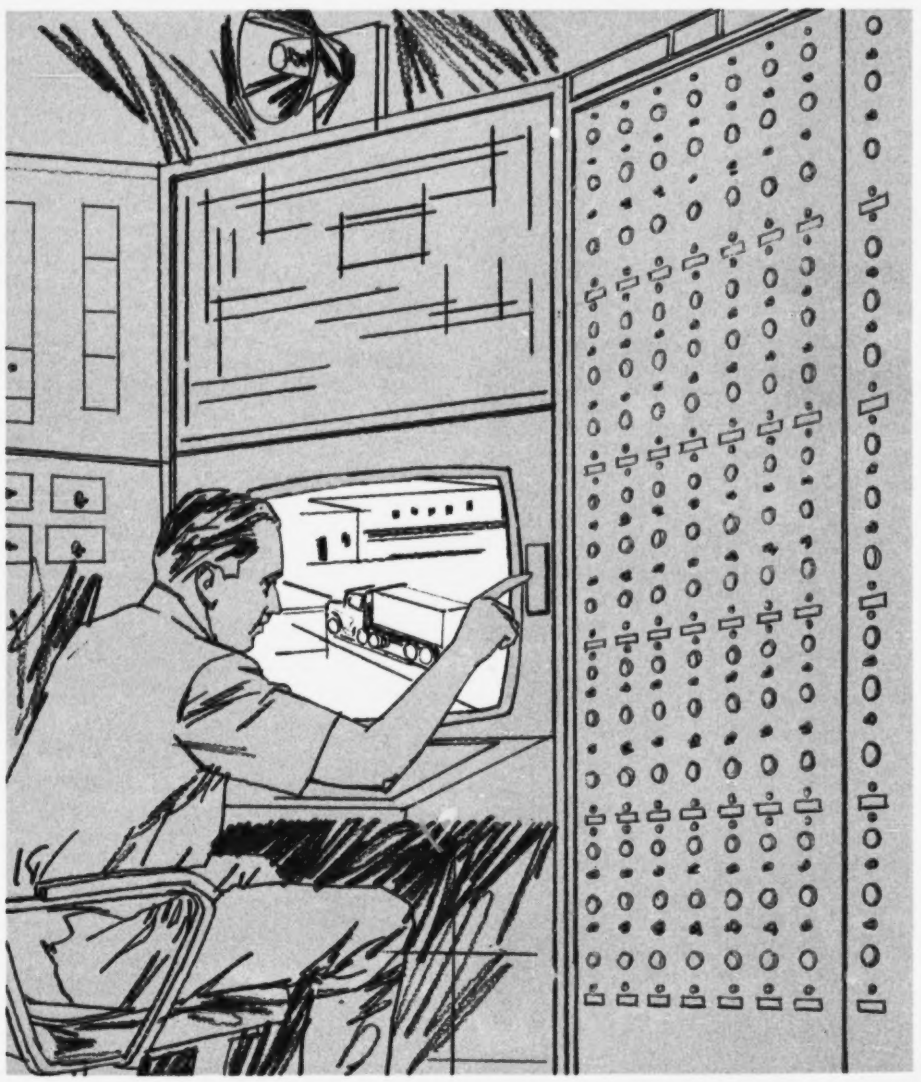
systems must have provisions for automatically checking circuits and actuating an emergency signal in the event of a line failure. This is generally known as simple line supervision and is quite common in fire alarm, equipment surveillance and security systems.

In addition, the best-designed security systems provide tamper supervision. This feature is required to guard against someone tampering with the wires without causing an actual short circuit or broken connection. Security systems which do not provide this feature can be defeated or compromised with surprising ease by expert intruders.

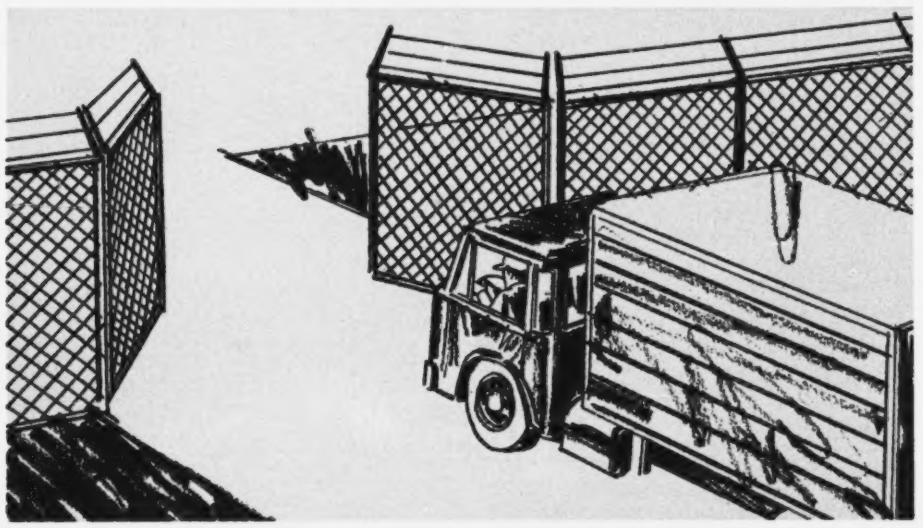
ACCESS CONTROL

Equipment is now available which permits you to remotely supervise all types of gates and doors, located both at the perimeter of your facilities and at interior locations.

This type of modern control system enables you to reduce your overhead costs significantly through the elimination of costly guard posts. (As we've mentioned, manning such a post can cost you $25,000 or more annually.) And these systems can free your existing guard force from sporadically-used posts to do much more effective protection work.



A good gate and door control system should include: (1) a signaling device for use by the person seeking to gain entrance; (2) a loud speaker-microphone for him to identify himself and receive instruction; (3) a gate or door position indicator; (4) an electro-mechanical release lock or motorized control which the guard can operate from headquarters after the person identifies himself properly and, (5) a control panel with two-way communication facilities that is located at a remote guard headquarters. Closed circuit television can also be added as an aid in identifying persons who wish to gain entrance.



The Honeywell gate and door control system (except closed circuit television) accomplishes all of the above functions with a single pair of wires which may be leased telephone lines. Thus, installation costs are minimized. Of course, closed circuit television requires special wiring considerations, such as coaxial cable, for example.

The signaling device may be a simple pushbutton or a sophisticated detection device. Loudspeakers and microphones (both functions are combined in one device in the Honeywell system) are used for identification and instructional purposes. The gate or door position indicator satisfies the guard that a gate is firmly closed, that a door is really locked, that a bolt is securely in place.

Most doors and some gates use an electro-mechanical lock release device. Pushing a button at the control panel energizes an electrical circuit which allows the person at the remote door or gate to open it. Large gates are frequently motorized and in such instances, controls

at guard headquarters permit the full positioning of gates from completely open to completely closed.

Control panels may take several forms. In the Honeywell system, small installations are usually handled with a desk-mounted console; large jobs involving several doors and gates usually employ modular units which are mounted together in a rack.

WATCHMAN'S TOUR SYSTEMS

In many facilities, watchman tours are required despite the presence of adequate electronic protection. To insure that the tour is made and to keep track of the touring guard, Honeywell has developed watchman tour systems.

Although these systems can be customized, they usually incorporate the features described here.

As the watchman starts his round, he inserts a key in a lock which is an integral part of a watchman's tour station. His action signals the control center that a tour is beginning and records that information. At each succeeding station, the guard inserts his key, again signalling the control center and recording the event. At the final station in the tour a special signal is transmitted indicating and recording that the tour has been completed.

A delinquency feature causes an alarm to sound at the control center if the touring guard does not get to the next station within a predetermined period of time (10 minutes, for example). This permits

the control center operator to locate his co-worker's last reported location and to determine the problem, if any, in the briefest possible time period.

To summon a touring guard at any time, the system uses a *recall* feature. By pushing a single button, the control center operator can light signal lamps at each tour station. As soon as the touring guard reaches that station he can communicate with the control center.

Several tours can operate simultaneously, all under the control of the central panel operator.

EQUIPMENT SURVEILLANCE

Consider the modern household. It contains dozens of electrical and mechanical devices: heating plant, refrigerator, range, water softener, and many more. Every piece of this equipment can fail and, according to "Murphy's Law," every piece of equipment will fail at some time or other. These failures can be minor, such as burning a slice of bread in a faulty toaster; expensive, such as spoiling a large quantity of meat because a deepfreeze stopped working; or disastrous, such as an explosion and fire caused by a defective heating unit.

Great as the equipment and appliance problem may seem to the home owner, in non-residential buildings the problem of watching over equipment is many times greater. In the first place, today's modern structures are almost more machine than building. The

number of fans, motors, pumps, compressors, and other equipment is often staggering. Secondly, many areas in any building or group of buildings are unattended for long periods of time which precludes early detection of most equipment failures. Third, it is becoming increasingly uneconomical to check on vast quantities of equipment with manpower. And fourth, a comparatively low degree of efficiency is attained with mere routine visits to each equipment area only two or three times during an eight-hour period.

Yet, we are continually using more and more equipment, and from automatic elevators to low-pressure boilers, this equipment is placed less and less under the direct supervision of a trained operator.

Systems which automatically monitor equipment are finding increasing usage. They are called "surveillance systems." Let's analyze what they can do.

Basically, an Equipment Surveillance system monitors all or a selected number of mechanical and electrical devices or systems. Malfunctions or off-normal conditions are instantly reported at a central surveillance panel which is constantly supervised by your own personnel or by some independent agency.

Thus, one man at the central panel may constantly check on all equipment in the building. In practice, this same man would usually receive other signals such as those for fire and security alarms. Further, this same man, provided with an integrated Honeywell temperature control central panel, could also observe, analyze and adjust temperature and humidity conditions throughout the facility.

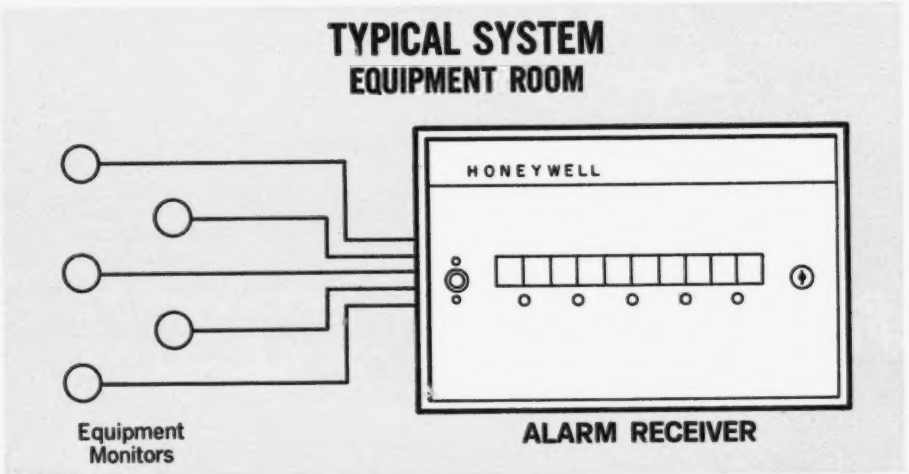
An equipment surveillance system basically consists of two elements: alarm transmitting devices and alarm receiving panels. The alarm transmitting devices take many forms: pressure switches, thermostats, power relays, bearing temperature sensors, etc.

Frequently, safety devices which are furnished with equipment have provisions for alarm circuits. In such instances, it is relatively simple to connect the alarm circuit to the alarm receiving panel.

Often, however, a sensing and alarm transmitting device must be added. A trained expert in this field can handle this situation at a surprisingly low cost.

Independent Versus Sequential Equipment Monitoring

The alarm receiving panel is the heart of any equipment surveillance system and for maximum benefit should be designed for the specific installation it is to control. A standard "package" is rarely, if ever, adequate. The preferred solution is to customize the alarm receiving panel from standard components. In this way, you can accomplish the precise results you want at a very reasonable cost.

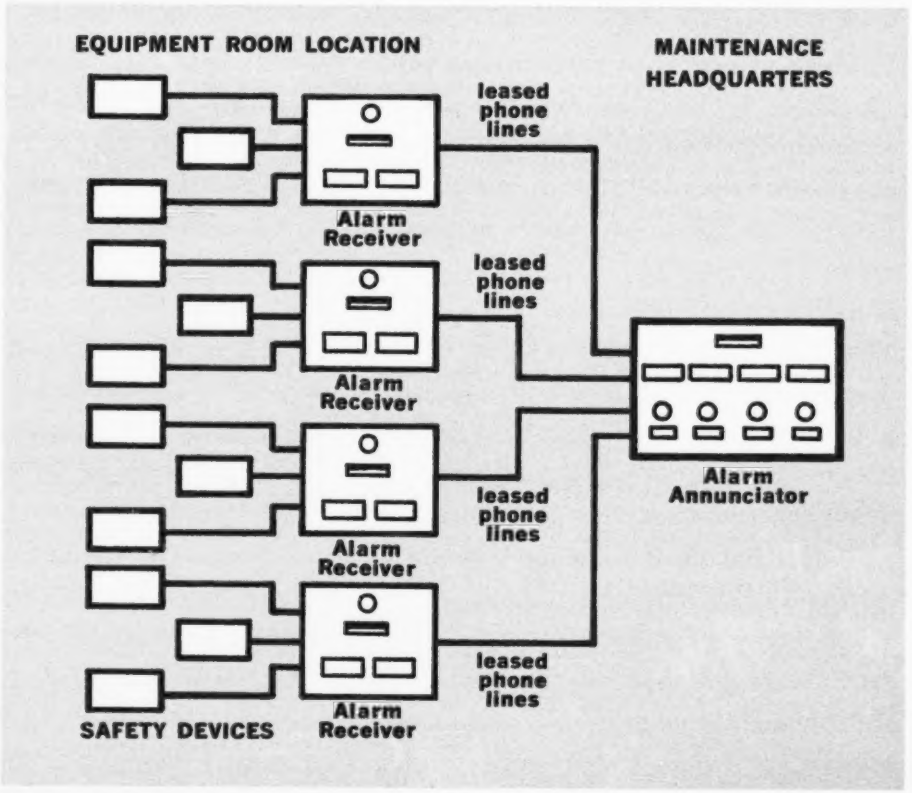


The desirability of customizing with standard components can be illustrated by the need to provide two different types of equipment monitoring: *independent* and *sequential*. An independent equipment monitoring system initiates an alarm whenever a malfunction or off-normal condition occurs in the system it is designed to monitor. It is called "independent" because it is used where the receipt of a series of inter-related, off-normal conditions would not occur. For example: When equipment which is being monitored has little or no effect on other equipment in the building, alarm signals for the off-normal equipment may be reported to the monitoring station in random order. But if large systems and related equipment are to be monitored, *sequential* equipment monitoring should be used.

Sequential equipment monitoring is used where many monitored devices are closely inter-related and where an off-normal condition at one device immediately causes off-normal conditions at other devices. It is called "sequential" because the initial cause of the trouble is clearly identified, and a resulting series or sequence of off-normal conditions is not annunciated. This system will lock in the

first alarm and exclude additional alarms which would result from the first off-normal condition; therefore, the primary malfunction can be pinpointed easily. This enables maintenance personnel to immediately identify a malfunction without any confusion from a multiplicity of alarms. For example, it is common to monitor the water level, pressure and combustion of a boiler. If the water level falls dangerously low, a safety device would shut off the combustion and the boiler pressure would begin to fall. These actions would happen rapidly and, without sequential monitoring each one would cause an alarm to go off, but the operator at the central location would not know which occurred first nor the original cause of the alarms. A sequential equipment monitoring system, however, would lock in the first alarm (low water level) and exclude the other alarms occurring in sequence.

When desired, Honeywell can provide voice intercommunication over the alarm signal wires between alarm transmitting devices and the alarm receiving point. No special communication system wiring need be added.



EQUIPMENT MONITORING APPLICATIONS

Virtually all of a building's significant pieces of equipment should be monitored to assure the highest possible efficency and safety. Some of the typical equipment and functions usually monitored include:

EQUIPMENT

Boilers	Generators
Turbines	Heat Exchangers
Chillers	Evaporators
Condensers	Absorbers
Pumps	Elevators
Fans	Lighting
Compressors	Sprinklers
Sump Equipment	Transformers
Refrigerators	Liquid Tanks
Air Handling Equipment	Gas Tanks

FUNCTIONS

Temperature	Power Failure
Humidity	Line Current
Flow	Voltage Fluctuations
Pressure	KW Consumption
Damper Positions	Fuel Supply
Valve Positions	Toxic Gases
Filter Efficiency	Leaks
Wind Velocity	Gas Volumes
Wind Direction	Peak Load Control
Liquid Levels	Start-Stop Operations

CENTRALIZED CONTROL SYSTEMS

The key element in any protection system is the central control panel. This is the nerve center to which all signals are transmitted and from which command and control functions are dispatched. It should be designed to permit the operator to have all the information he requires instantly available, quickly identifiable, and easily interpreted. Since this response time may be critical, the operator cannot waste time when an alarm condition exists.

Honeywell control centers are customized to the installation they serve from standardized modules and components. They frequently include graphic representations of the protected areas so as to give the operator an instant visualization of the area in question when an alarm occurs. Larger installations frequently employ the Selectographic* console which provides graphic depictions of 100 individual systems. Each system is projected (on demand or on alarm) on a screen in the center of the console. The graphic display may include specific instructions to the operator.

The central control center should always provide a *printed* record of alarms and control operations. The printed record provides management with a valuable control tool as well as documentation of events occurring during protected periods of operation. Alarms are permanently recorded, pinpointing the exact time and duration of alarms for the operator, his supervisor and management. Recording control functions establish the fact and the time that systems were turned on or off, activated or deactivated, etc. Whenever it is not feasible to include alarm recording initially, provisions should be made to add it at a later date.

*Trademark

SUMMARY

One of the strongest points in favor of a proprietary building security system is the fact that such an installation actually contributes to your company's profits (or reduces operating overhead). A building security system does not mean additional expense because you can show how the cost of security will be reduced substantially in the following years.

In addition, you can have a more comprehensive security system and program than by any other means. With a Honeywell system, you can keep a continuous, 24-hour surveillance on *hundreds of additional* areas or pieces of equipment. If you tie-in a comprehensive equipment monitoring system with your security system, you can reduce the number of personnel needed to inspect the operation of boilers, compressors, chillers, and other mechanical and electrical equipment in your building.

To achieve such vast protection economically, Honeywell uses a variety of electronic devices. Although all of them are standard devices, haphazard or inexpert installation does not offer complete protection. In every installation, Honeywell specialists tailor the entire system to the size and type of facility so that maximum protection can be obtained reliably, automatically and at minimum cost.

When you agree to investigate a Honeywell Proprietary Building Security System, Honeywell sales engineers work closely with you (or your consultants and staff) to analyze exactly what security needs should be fulfilled by the system. Then, a Honeywell Building Security Specialist will custom design the system to your needs.

With your assistance, Honeywell will also provide you with exact figures on the cost of the system, estimated savings per year and the recovery period of the system.

In addition to designing the system, Honeywell accepts total responsibility for manufacture, installation and servicing. Honeywell even trains your staff on how to operate the system. You have an iron-clad guarantee that it will be a completely efficient, trouble-free system that meets your expectations.

BUILDING SECURITY CHECKLIST

The following checklist gives a general indication of the types of Honeywell Proprietary Building Security Systems that are available. Under each system classification are a few examples of the kinds of property, equipment or functions that can be protected by these systems.

I. Outdoor Protection
   A. Property line protection
   B. Storage area protection
   C. Vehicle protection (vans, trailers, etc.)

II. Building Perimeter Protection
   A. Doors, windows, transoms, other accessible openings
   B. Floors, walls, ceilings

III. Area Protection
   A. Vaults
   B. Restricted or closed areas
   C. Storage areas
   D. Offices

IV. Object Protection
   A. Safes, files, etc.
   B. Models, prototypes, etc.
   C. Paintings, works or art, etc.

V. Fire Detection
   A. Sprinkler system supervision
   B. Fixed temperature and rate of rise detection
   C. Ionization detection

VI. Access Control
   A. Perimeter doors and gates
   B. Interior doors and gates

VII. Emergency Signaling

VIII. Status Indication and Control
   A. Personnel
   B. Vehicles
   C. Documents
   D. Articles

IX. Equipment Monitoring
   A. Primary heating and cooling equipment
   B. Water (towers, sumps, etc.)
   C. Power
   D. Major equipment (elevators, generators, motors, pumps, etc.)
   E. Temperature and humidity

X. Retransmission of Alarms
   A. Police Department
   B. Fire Department
   C. Other locations

FOR FURTHER INFORMATION

Whatever your building requirements may be, Honeywell can provide you with the technical assistance, systems and components in these technologies:

- Building Automation
- Temperature Control
- Building Security
- Fire Detection
- Equipment Surveillance
- Clocks

In addition, Honeywell provides all supporting services, such as maintenance programs and personnel training in the operation of these systems.

For a thorough discussion of exactly what Honeywell's capabilities can mean to you and your building, call your local Honeywell Commercial Division Branch Office. Honeywell is listed in the Yellow Pages under "Controls, Control Systems & Regulators." Or if you prefer, write to Honeywell, Commercial Division, 2701 Fourth Avenue South, Minneapolis, Minnesota 55408.

FIVE INFORMATIVE PLANNING GUIDES

This planning guide is one of five booklets prepared by Honeywell to present a basic discussion of building automation systems, security and fire alarm systems, temperature control systems and preventive maintenance. You are encouraged to send for any of these booklets that may be helpful to you. *Please specify the appropriate form number.* Write to: Honeywell, Inquiry Supervisor (M.S. G6118), 2701 Fourth Avenue South, Minneapolis, Minnesota 55408. *In Canada:* write to: Honeywell Controls Limited, Commercial Division (Mail Station 350), Vanderhoof Avenue, Toronto 17, Ontario.

Report no. 54-0349

1 in U.S.A.